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NOTEWORTHY COLLECTIONS

CALIFORNIA

RANUNCULUS CANUS Benth. var. *LUDOVICIANUS* (Greene) L.D.Benson (RANUNCULACEAE). — San Luis Obispo Co., Highway 41 between Shandon and Creston at gate to 3045 Highway 41, north-facing hillside with foothill woodland, *Quercus lobata* Née dominant above road; many annual and perennial herbs beneath and between oaks, scattered on north facing slope in partial shade or in openings among oaks, 35.578125°, −120.447997°, 390 m, 4 April 2017, *David Keil 34378* (OBI); Highway 41 between Creston and Shandon at 3220 Highway 41, foothill woodland and old almond orchard, scattered oaks, herbaceous layer with various annual and perennial wildflowers, locally common, 35.579753°, −120.453712°, 400 m, 4 April 2017, *David Keil 34380* (OBI); Coast Range, road between Creston and Shandon, c. 9 miles SW of Shandon (Shedd Canyon 7.5′ Q, 35°34′37″N [35.576944°], 120°27′49″W [−120.463611°] (±1000 m), 427–457 m, 11 May 1963, *F. C. Vasek 630511-02* (UCR4408).

Previous knowledge. Greene (1886) described *Ranunculus ludovicianus* based on collections from "High valleys among the mountains of San Luis Obispo Co., California, and eastward to Tehachapi Pass. Collected by Mrs. Curran, in 1884". The epithet "ludovicianus" is a derivative of "Ludovicus," Latin for Louis or Luís and was apparently used by Greene as a reference to San Luis Obispo Co. The plant was soon treated as a variant of more widespread species. Gray (1886), apparently without having seen the specimens described by Greene, proposed a vaguely characterized *Ranunculus californicus* Benth. var. *latilobus* A.Gray and included Greene's *R. ludovicianus* as a synonym. Greene (1892) published *R. californicus* var. *canescens* Greene and commented that it "belongs to the middle elevations of the Mt. Diablo Range and the valleys among them, from Niles to the hills east of Livermore, thence southward to San Luis Obispo Co. It was part of my *R. Ludovicianus*." Greene's (1892) restriction of *R. ludovicianus* to the plants ranging from Kern Co. to San Bernardino and his exclusion of the plants from San Luis Obispo Co. is a clear indication that he had based the name on at least two specimens. Robinson (1895) recognized Gray's *R. californicus* var. *latilobus* as "a common form, especially southward, from San Francisco Bay to San Diego and San Bernardino," with *R. ludovicianus* treated as a synonym. He commented about var. *latilobus* that "some forms too nearly approach *R. canus*." Robinson further noted that "a number of further varieties of the polymorphous *R. californicus* have been characterized by Prof. Greene, Fl. Francis. 299, & Erythea, i. 125; the material at hand, however, fails to show these forms well-marked among frequent intermediates."

Davis (1900) proposed *R. californicus* var. *ludovicianus* (Greene) K.C.Davis, a treatment that was followed by Jepson (1922, 1925) and Benson (1936). Benson (1936) effectively lectotypified Greene's *R. ludovicianus* by citing the type collection as: "High Valleys among the mountains of San Luis Obispo Co., California," and the collector as "Mrs. Curran (Brandegee)."

Benson (1941) revised his opinion and treated Greene's buttercup as *Ranunculus canus* Benth. var. *ludovicianus* (Greene) L.D.Benson. Benson attempted in vain to locate type material of *R. ludovicianus*: "Neither the Brandegee Collection at the University of California nor the Herbarium Greeneanum contains a specimen collected by Mrs. Curran (Brandegee) in San Luis Obispo Co., and no specimen of this variety has been collected in San Luis Obispo Co. at any other time. The epithet ludovicianus has been consistently applied to the common many-petalled plant growing in the Tehachapi Mountains, and the writer believes that, in the absence of a type, established custom should be law. The 1884 collection from Tehachapi by Mrs. Curran (Brandegee) is designated as a LECTOTYPE, and, in the event that it is not rediscovered, the 1895 collection by Mrs. Brandegee (Herbarium of the University of California) should be considered a substitute for it. The 1884 specimen is to be found in neither the University of California Herbarium nor the Herbarium Greeneanum." Benson (1948) formally designated an 1895 collection by Mrs. Brandegee from Tehachapi as the neotype for *R. ludovicianus* (UC205003; isoneotype, POM11643), thus fixing the application of the name with the plants of the Tehachapi Range [unless the 1884 San Luis Obispo Co. specimen collected by Curran were to be relocated]. A second isoneotype in the Stanford University Herbarium (DS197721 = CAS-BOT-BC378843) is housed at the California Academy of Sciences (CCH 2017).

Where are the missing type specimens? A search of the Consortium of California Herbaria database (CCH 2017) uncovered no collections whatsoever made by Katharine Curran in 1884 from San Luis Obispo Co. and only a couple from Tehachapi in that year. At the time of Greene's publication of *R. ludovicianus*, Curran was Curator of Botany at the California Academy of Sciences and editor of the Bulletin of the California Academy of Sciences (Daniel 2008, Carter 2009), and her collections from that time would be expected to be either in the herbarium of the California Academy of Sciences or in her personal herbarium. For a time Greene worked as a fellow curator with Katharine Curran in the Academy herbarium (Carter 2009, Daniel 2008), and it was likely during this time that he examined her 1884 collections; he published his new buttercup in the Bulletin. In subsequent years Katharine Curran [Brandegee after 1889] and E. L. Greene became bitter enemies (Carter 2009, Daniel 2008). Katharine and her husband T. S. Brandegee together amassed an herbarium of their own estimated to include about 100,000 specimens (Anonymous 1906), that was donated to the University of California in 1906. Benson (1948) did not locate any type material in the Greene Herbarium (ND-G). Greene also deposited a few specimens in the herbarium of the Catholic University of America (LCU), which was dispersed by sale in the 1980s (Tucker et al. 1989); but none of the herbaria that acquired type or Ranunculaceae specimens from LCU (CM, NA, WIS) houses any of Curran's *Ranunculus* specimens (Carnegie Museum of Natural History 2017; Mid-Atlantic Herbarium Consortium 2017; USNA 2017; M. A. Feist, pers. comm.). The absence of the 1884 collections from San Luis Obispo Co. and Tehachapi from the Brandegee and Greene herbaria means that it is probable that the specimens were deposited in the California Academy of Sciences herbarium and were destroyed in the 1906 San Francisco earthquake and fire that consumed most of the collections of the California Academy of Sciences, a conclusion also reached by Twisselmann (1967).

Several early floristic treatments (Greene 1892; Jepson 1922, 1925) recognized *R. californicus* var. *ludovicianus* as a taxon restricted to the Tehachapi Mountains or ranging to the San Bernardino Mountains (and in some reports to San Diego Co.). Either the exclusion of San Luis Obispo Co. from the range of the taxon initiated by Greene (1892) was followed, or in the absence of any additional specimens from the county, the initial report was ignored. Subsequent floras (Abrams 1944; Munz and Keck 1959; Munz 1974; Whittemore 1997, 2012), following the taxonomy of Benson (1941, 1948), treated the plant as *R. canus* var. *ludovicianus*. Hoover (1970) did not mention var. *ludovicianus*, but in his discussion of *R. californicus* he commented that "some plants, especially toward the interior, are rather conspicuously silky-hairy and in that respect suggest var. *canus* (Benth.) B. & W. [W.H.Brewer & S.Watson]." Wilken (1993) did not recognize infraspecific taxa in *R. californicus* or *R. canus*, treating var. *ludovicianus* as a synonym of *R. canus*.

In preparations for publication of the second edition of the Vascular Plants of San Luis Obispo Co., California, I used the resources of the Consortium of California Herbaria database (CCH 2017) to access specimen records of plants collected in San Luis Obispo Co. Various specimen identifications came to light that I did not have in my records, and I sought to determine the accuracy of the determinations of these specimens. Among the reports was a collection by Frank Vasek in UCR determined as *Ranunculus canus* var. *ludovicianus*. I requested a loan of this specimen and others from UCR, and upon examination of the specimen I determined it to be correctly identified according to the keys in the Jepson Manual (Whittemore 2012). This led me to the chronicle of the discovery of this plant in the 1880s, variations in its subsequent taxonomic disposition, the disappearance of its syntypes, and lecto- and neotypification that are recounted above. In April 2017 I set out to relocate Vasek's collection site and any other localities where the plants were growing, and my efforts resulted in finding plants from nearby sites that strongly resemble Vasek's specimen.

Achenes of *R. canus* var. *ludovicianus* were described by Benson (1948) as usually 4–5 mm. long, 3 mm broad; achenes of *R. californicus* were described as 1–2.8 mm long, 1–2.3 mm broad. In his key to species, Whittemore (2012) separated *R. canus* var. *ludovicianus* from *R. californicus* by "Fruit body 3.4–4.2 mm, beak deltate" vs. "Fruit body 1.8–3.2 mm, beak lanceolate." Fully mature achenes from Vasek's collection (from early May) measure up to 5 mm long and 4 mm wide. Immature achenes from the specimens I collected (in early April) had similar dimensions when fresh, but shrank somewhat in drying, the largest on individual dry specimens measuring 3.5–5 mm long and 3–3.5 mm wide. Otherwise similar plants from Shell Creek Road (*Keil 34368*, OBI) and La Panza Road (*Keil 34394,* OBI) had not-fully-filled achenes that measured within the size range for *R. canus* var. *ludovicianus* when fresh, but when dry the largest are 3 mm long, thus falling within the upper size range for *R. californicus*.

Significance. This report confirms the occurrence of the plant named by E. L. Greene as *Ranunculus ludovicianus* in its namesake county and pinpoints for the first time localities where these plants grow in the county. They are the first records of the taxon from San Luis Obispo Co. since the 1884 syntype collection by Katharine Curran.

Remaining to be investigated is the relationship between the San Luis Obispo Co. populations and the similar plants of the Tehachapi, San Bernardino, and San Diego areas which, since the studies of Benson (1941, 1948) have borne the name *R. canus* var. *ludovicianus*. Greene (1892) opined that the San Luis Obispo Co. plants should actually be treated as part of *R. californicus* in his var. *canescens*. But in the absence of any specimens from San Luis Obispo Co., Greene's hypothesis could not be investigated. Benson was unable to examine any San Luis Obispo Co. material ascribed to var. *ludovicianus* as a part of his studies. In the absence of specimens, and maybe also as a result of Greene's (1892) exclusion of the San Luis Obispo Co. plant, San Luis Obispo Co. disappeared from range statements in floristic treatments. Whittemore (1997) stated that "*Ranunculus canus* var. *ludovicianus* is endemic to the Transverse Ranges of California." But he expressed doubt as to its placement in *R. canus*: "Pending further study, I am reluctantly following L. D. Benson's (1948) placement of this taxon. The plants have the floral characters of *R . californicus* and have often been included in that species. Indeed, forms of *R . californicus* from the foothills west of the San Joaquin Valley may also have large achenes with deltate beaks. Those plants differ from *R . canus* var. *ludovicianus* only in their ovate leaf segments. Further study of the group is much needed." [The shape of ultimate leaf segments of the San Luis Obispo Co. specimens varies from oblong-elliptic to lance-oblong.] Indeed the entire complex of *Ranunculus californicus*, *R. canus*, and *R. occidentalis* Nutt. is in need of an investigation using modern tools, but this is far beyond the scope of this report.

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